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A New Species of the Genus *Paramoera* (Crustacea: Amphipoda) from the Intertidal Zone of Hokkaido, Northern Japan

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ABSTRACT—A new species of *Paramoera* from the intertidal zone at Shiriuchi, Hokkaido, northern Japan, is described. The ventral projection of cephalic lobes in the new species is singular to the genus *Paramoera,* and the intimation that the new species is one of the genus *Relictomoera,* being separated from *Paramoera* on the basis of this character, is abolishes through re-examination of the known species of *Relictomoera* because they have usual anterocephalic lobes anteromedially protruding as in members of *Paramoera* and related genera: the genus *Relictomoera,* therefore, is unvalid, and *Relictomoera relicta* and *R. tsushimana* must be replaced to the former genus, *Paramoera.* Besides the cephalic lobes, the characteristic that the pleonal epimeron 3 of the new species prominently expands backward has not previously been known in any species of the genus *Paramoera* and the related genera.

INTRODUCTION

Pontogeneid gammarids swarming in the intertidal zone of Shiriuchi, Hokkaido, were collected by Y. Hanamura, who sent me eight specimens for identification. These specimens, being all female, clearly show characteristics of the genus *Paramoera* except for one character of head, namely the possesion of ventral projection in the anterocephalic lobes. This appearance intimates that this gammarid closely relates to the known species of *Relictomoera,* which has been separated from the genus *Paramoera* by J. L. Barnard and G. S. Karaman [1] on the basis of this character and accomodates two species, *R. relicta* (Uéno, 1971) [2] and *R. tsushimana* (Uéno, 1971) [3]. Thus, I re-examined the cephalic lobes of these two species in Uéno's type-specimens and noticed his mis-observation. The result is discussed in remarks of the present species.

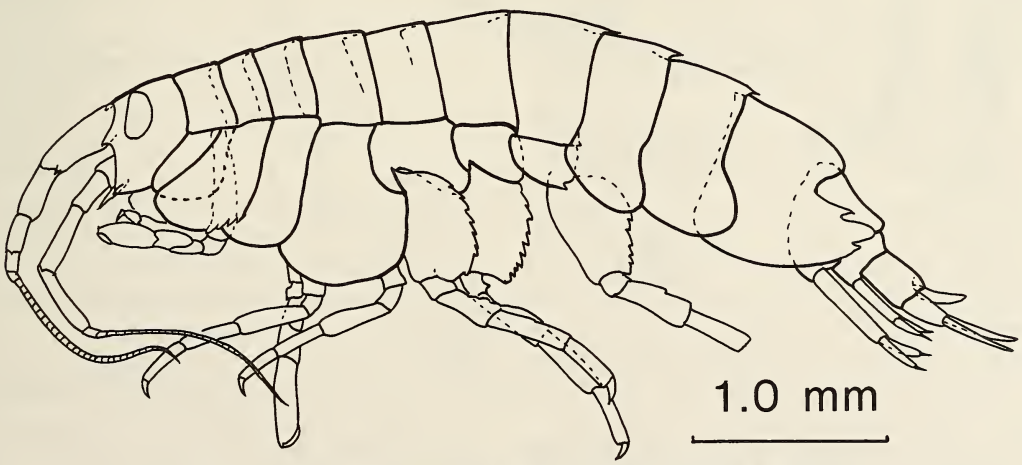

Fig. 1. *Paramoera hanamurai* sp. nov. Holotype (female, 4.5 mm).

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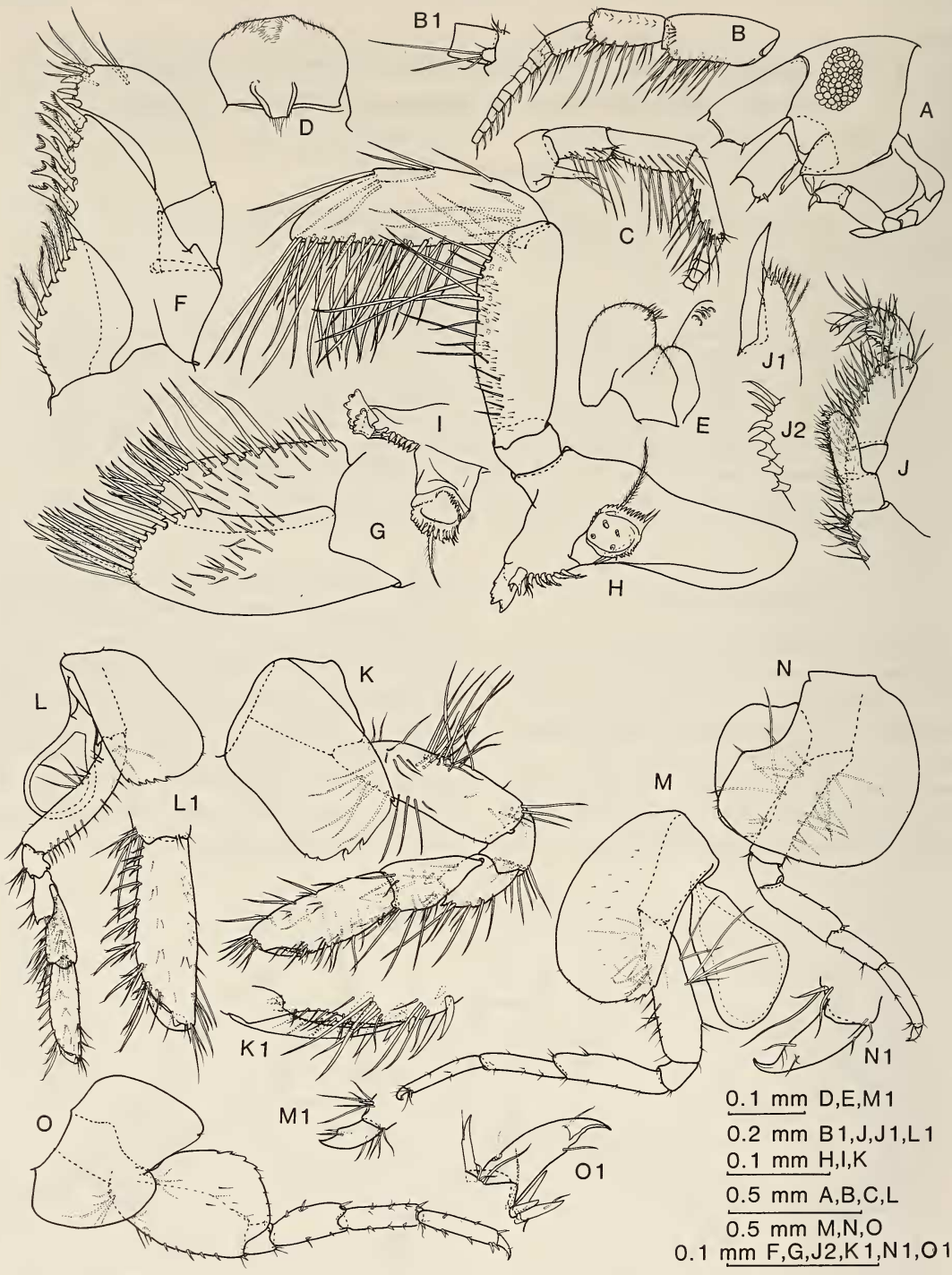

Fig. 2. *Paramoera hanamurai* sp. nov. Holotype (female, 4.5 mm). A: Head. B and B1: Antenna 1 and accessory flagellum. C: Antenna 2. D: Upper lip. E: Lower lip. F: Maxilla 1. G: Maxilla 2. H: Right mandible. I: Left mandible. J, J1 and J2: Maxilliped, inner plate and outer plate. K and K1: Gnathopod 1 and palm. L and L1: Gnathopod 2 and propod. M and M1: Pereopod 3 and dactyl. N and N1: Pereopod 4 and dactyl. O and O1: Pereopod 5 and dactyl.

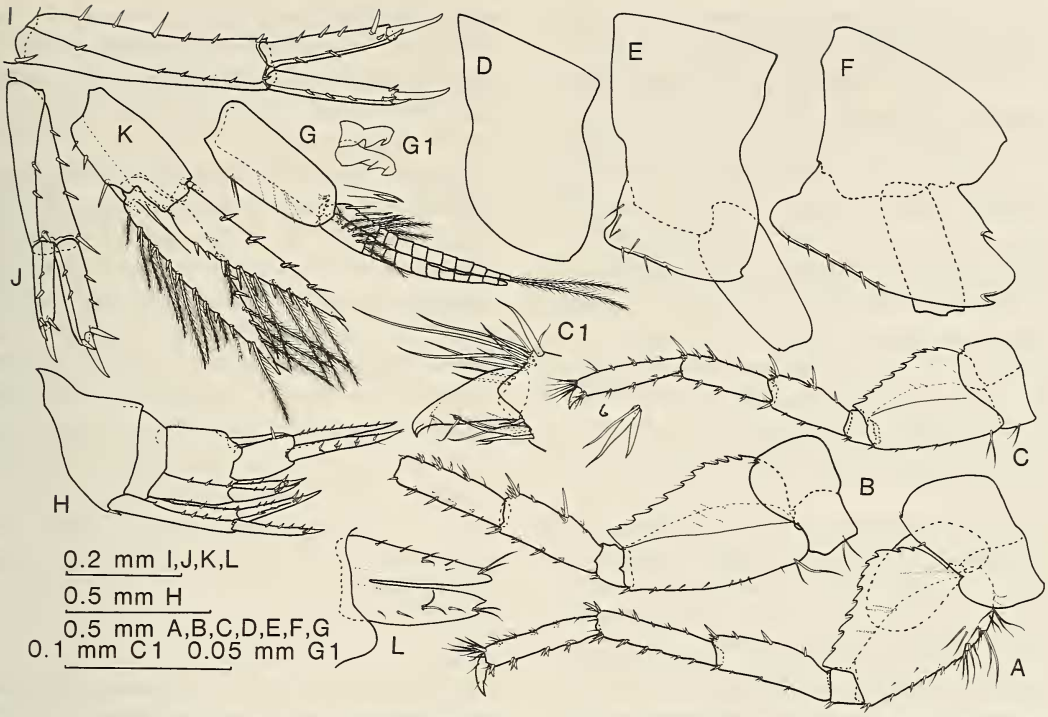

FIG. 3. *Paramoera hanamurai* sp. nov. Holotype (female, 4.5 mm) and paratype no. 1 (female, 3.4 mm: C and C1). A: Pereopod 6. B: Pereopod 7. C and C1: Pereopod 7 and dectyl in the paratype no. 1. D: Pleonite 1. E: Pleonite 2. F: Pleonite 3. G and G1: Pleopod 2 and coupling spines. H: Urosome. I: Uropod 1. J: Uropod 2. K: Uropod 3. L: Telson.

All the specimens are deposited in the collection of Asia University.

Paramoera hanamurai sp. nov.
(Figs. 1–3)

Type series

Holotype: Female, 4.5 mm, collected from the intertidal zone in Shiriuchi of Kami-iso District, Hokkaido, northern Japan; 22 May 1984; coll. Yukio Hanamura. Paratypes: seven female specimens (nos. 1–7), collected together with the holotype. Holotype and a part of paratype no. 1 (3.4 mm) are mounted on slide glasses in gum-chloral medium. Collection number: Asia 1.

Description of holotype (female)

Body. 4.5 mm long. Head: rostrum very small; two upper and lower plates of anterocephalic lobes slightly overlapped each other, the lower one extending forward ventrally. Gills present on pereonites 2–6. Pleonal epimeron 3 prominently expanding posteriorly, armed with two upper and ventral notches posteriorly, with 6 additional spines on anterior half of ventral margin.

Antennae. Antenna 1 shorter than antenna 2; peduncular segments 1–2 armed ventrodistally with 2 and 1 spines respectively; accessory flagellum uni-segmented, vestigial, with 2 long setae apically; majority of flagellar segments with one aesthetasc ventrodistally. Antenna 2: gland cone of peduncular segment 2 extending to proximal 0.75 point of peduncular segment 3, tapering; peduncular segment 3 with ventrodistal spine.

Mouthparts. Lower lip: inner plates almost coalescent with outer plates; outer plates with about 7 short setae on inner angle of shoulder. Maxilla 1: inner plate with 7 plumose facial setae; outer plate with 10 paired, comb-like spines, of

which 3 are bified; palp biarticulate, with 4 conical spines apically. Inner plate of maxilla 2 with facial row of 5 long setae. Both mandibles similar except for lacinia mobilis and number of accessory spines; incisor ornamented with 5 teeth; lacinia mobilis in left mandible ornamented with 5 teeth, in right mandible bifid, following 6 serrate accessory spines, plus one bifid spine in left mandible; terminal segment of palp subequal to penultimate one, brush-like, finely setose on inner side. Maxilliped: inner plates with 3 conical spines and 5 plumose setae; outer plates reaching to proximal 3/8 point on second segment of palp, with 8 tooth-like spines gradually getting slender, 3 proximal spine bifid; length ratio of palpar segments 2:7:5:4.

Gnathopod 1. Rather feeble, subchelate, almost uniform in width. Coxa 1 rectangular, smaller than coxa 2. Length ratio of segments from basis to propod 14:5:6:7:12. Palm undefined, with 3 rows of 3 spines on inner side. Dactyl reaching to middle row of spines on palm when closed.

Gnathopod 2. Subchelate, sublinear, distinctly longer than gnathopod 1. Coxa 2 subrectangular, serrate on anterior half of ventral margin. Length ratio of segments from basis to propod 11:2:3:6:7. Palm slightly concave, undefined. Dactyl fitting into concavity of palm when closed.

Pereopods 3–4. Similar. Coxa 4 slightly concave along upper half of posterior margin. Posterior length ratio of segments from basis of propod 11:3:8:6:6 in pereopod 3, 45:15:32:22:27 in pereopod 2. Propod with 1 spine and 2 unequal setae posterodistally. Dactyl small, with claw-like apical part.

Pereopods 5–7. Anterior length ratio of segments from basis to propod approximately 6:1:3:3:3 in pereopod 5, 12:2:8:9:9 in pereopod 6; propod in pereopods 5–6 provided with 3 unequal locking spines; dactyl in pereopods 5–6 small, with claw-like apical part. Basis of pereopod 5 winged posteriorly, subrectangular, with 4 small or minute teeth aroung medial part of posterior margin; in pereopod 6 most expanding backward at proximal 0.33 point of posterior marginal length, thin posterior plate decreasing in width on distal 0.66 of length, distinctly serrate posteriorly. Pereopod 7, missing propod and dactyl, similar to pereopod 6 except for more slender and less serrate.

Pleopod 1. Rami equal in length, 1.4 times as long as peduncle; proximal segment of inner ramus with 3 bifid setae; terminal swimming setae 0.64 time as long as rami.

Uropods. Uropod 1, excluding terminal spines, not extending beyond peduncle of uropod 3; rami equal in length, about 0.5 time as long as peduncle, with apical set of 2 spines, one spine stout and elongate. Uropod 2: rami with a terminal set of 3 spines, central spine stout and elongate; inner ramus slightly longer than outer ramus. Uropod 3 extending far beyond uropods 1–2; rami lanceolate, aremd with spines and plumose setae marginally; inner ramus longer than outer ramus.

Telson. Not extending beyond peduncle of uropod 3, cleft to about 0.8 time its length; lobes apically bifid, with pair of setae on apical notch, lacking spines.

Paratype

Paratypes are the same as the holotype in external appearances except for the propod and dactyl of pereopod 7 missed in the holotype. The propod and dactyl of pereopod 7 in the paratype no. 1 specimen (3.4 mm in body length) is similar to those of pereopod 4.

Etymology. The specific name *hanamurai* is in honour of Mr. Y. Hanamura who collected the specimens of this new species.

Remarks

The present species has two outstanding characteristics in the molphology of the head; the two upper and lower plates of anterocephalic lobes are slightly overlapped each other, and the lower one protrudes forward. This latter appearance is reminiscent of the cephalic lobes of the known species of the genus *Relictomoera,* which has been separated from the genus *Paramoera* by J. L. Barnard and G. S. Karaman [1] on the basis of this appearance and accomodates only two species, namely *R. relicta* (Uéno, 1971) [2] and *R. tsushimana* (Uéno, 1971) [3]. Thus, I re-examined the cephalic lobes of these two species in Uéno's type-specimens: ten of twenty-seven specimens in *R. relicta* because all the specimens are in a glass tube, and the holotype in *R. tsushimana.* This

observation made it clear that the cephalic lobes of these two species show anteromedially protrudent contour usually observed in members of *Paramoera* and related genera [1–22] and that they must be replaced to their former genus, *Paramoera* [2–3]. On the other hand, the generic characteristics in the present species well agree with difinition of the genus *Paramoera* [4, 7–8, 11]. Therefore, the present species can be treated as a new species of the *Paramoera* on the basis of these characteristic cephalic lobes here. Furthermore, the feature that the pleonal epimeron 3 of the new species prominenlty expands backward has not previously been known in any species of the genus *Paramoera* and the related genera [2–4, 6–22].

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REFERENCES

1 Barnard, J. L. and Karaman, G. S. (1982) Classificatory revisions in gammaridean Amphipoda (Crustacea), part 2. Proc. Biol. Soc. Wash., **95**: 167–187.

2 Uéno, M. (1971) The fauna of the insular lava caves in west Japan. VII. Subterranean Amphipoda. Bull. Nat. Sci. Mus. Tokyo, **14**: 161–170.

3 Uéno, M. (1971) Subterranean Amphipoda from the Islands of Tsushima. Bull. Nat. Sci. Mus. Tokyo, **14**: 195–199.

4 Barnard, J. L. (1952) Some Amphipoda from central California. Wasman J. Biol., **10**: 9–36.

5 Barnard, J. L. (1969) The families and genera of marine gammaridean Amphipoda. Bull. U. S. natn. Mus., **271**: 1–545.

6 Barnard, J. L. (1969) Gammaridean Amphipoda of the rocky intertidal of California: Monterey Bay to La Jolla. Bull. U. S. natn. Mus., **258**: 1–230.

7 Barnard, J. L. (1972) The marine fauna of New Zealand. Mem. N. Z. Oceanogr. Inst., **62**: 1–216.

8 Barnard J. L. and Drummond, M. M. (1987) Rectification of *Amphoediceros willisi* Fearn-Wannan (1968), genus and species remorved to *Paramoera* Miers. Proc. R. Sco. Vict., **99**: 13–18.

9 Barnard, K. H. (1916) Contributions to the crustacean fauna of South Africa: The Amphipoda. Ann. S. Afr. Mus., **15**: 105–302.

10 Barnard, K. H. (1932) Amphipoda. Discovery Report, **5**: 1–326.

11 Bellan-Santini, D. et Ledoyer, M. (1974) Gammaridens (Crustacea-Amphipoda) des Iles Kerguelen et Crozet. Tethys, **5**: 635–708.

12 Bousfied, E. L. (1958) Fresh-water amphipod crustaceans of glaciated North America. Canadian Field Naturalist, **72**: 55–113.

13 Chevreux, E. (1906) Crustacés amphipodes: Expédition Antarctique Française (1903–1905) commandée par le Dr. Jean Charcot. Sci. Nat.: Doc. Sci.: 1–100.

14 Griffiths, C. L. (1974) The Amphipoda of southern Africa part 2. The gammaridea and Caprellidea of south west Africa, south of 20°S. Ann. S. Afr. Mus., **62**: 169–208.

15 Ledoyer, M. (1982) Faune de Madagascar. 59(1). Crustacés amphipodes gammariens. Familles des Acanthonotozomatidae à Gammaridae. Editions du C. N. R. S.: 1–598.

16 Nicholls, G. E. (1938) Amphipoda Gammaridea. Australas. Antarct. Exped. 1911–14, Sci. Repts. ser. C-Zool. and Bot., **2**: 1–145.

17 Schellenberg, A. (1931) Gammariden und Caprelliden des Magellangebietes, Südgeorgiens und der Westantarktis. Zool. Res. Swed. Antarc. Exped., 1901–1903, **2**: 1–290.

18 Stebbing, T. R. R. (1906) Amphipoda I: Gammaridea. Das Tierreich, **21**: 1–806.

19 Stephensen, K. (1927) Papers from Dr. Th. Mortensen's Pacific Expedition 1914–16. XL. Crustacea from the Auckland and Campbell Islands. Vidensk. Medd. fra Dansk naturh. Foren, **83**: 289–390.

20 Stephensen, K. (1944) Some Japanese amphipods. Vidensk. Medd. fra Dansk naturh. Foren, **108**: 25–88.

21 Thurston, M. H. (1974) Crustacea Amphipoda from Graham Land and the Scotia Arc, collected by operation Tabarin and the Folkland Islands dependencies survey, 1944–59. Br. Antarct. surv. Sci. Rept., **84**: 1–89.

22 Uéno, M. (1933) Three noticeable freshwater Crustacea of Hokkaido. Annnot. Zool. Japan., **14**: 115–122.